Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Review of Part 87 of the Commission's Rules	)	WT Docket No. 01-289
Concerning the Aviation Radio Service	)	

COMMENTS
OF
GARMIN AT, INC.

Garmin AT, Inc. (Garmin AT) hereby submits the following Comments in response to the Commission's Further Notice of Proposed Rule Making in the above-referenced matter.[1] Garmin AT has worked with government and industry to promote flight safety through improved situational awareness by developing and implementing the Automatic Dependent Surveillance-Broadcast (ADS-B) service where aircraft automatically provide data derived from on-board navigation and position fixing systems via a broadcast-mode on the Universal Access Transceiver (UAT) 978 MHz link. Garmin AT has supported the Federal Aviation Administration (FAA) trials of UAT technology in Alaska, and continues to support FAA efforts to deploy UAT technology in the lower 48 states. Recently, in response to Garmin AT's request which was supported by the FAA, the Commission granted a waiver in order to authorize the first Type Certification and operation of UAT transceivers.[2]

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[1] *Report and Order and Further Notice of Proposed Rule Making,* Review of Part 87 of the Commission's Rules Concerning the Aviation Radio Service, WT Docket No. 01-289 (Rel. Oct. 16, 2003) 69 Fed. Reg. 19140 (April 12, 2004)*(FNPRM*).

[2] *Order,* GARMIN AT, INC., Request for Waiver of Part 87 Rules to Permit Equipment Authorization and Use of Universal Access Transceivers on the Frequency 978 MHz (Rel. June 28, 2004) (Chief, Public Safety and Critical Infrastructure Division,Wireless Telecommunications Bureau).

Introduction

Because of its extensive work with the implementation and development of UAT, Garmin is pleased to have this opportunity to comment on the FNPRM. In the Section dealing with Universal Access Transceiver Technology,[3] the Commission has requested comment on:

- Any preclusive effect that the UAT rules might have on other services, including the possibility of harmful interference; and,
- Whether there is a need to make any corresponding changes to the Section 2.106 Table of Frequency Allocations.

Garmin AT will also provide comments on the proposed UAT rules at Appendix B.

Preclusive Effect and Possible Harmful Interference

When the UAT specifications were written by RTCA/SC-186 Working Group 5, a great amount of effort was devoted to the issue of compatibility with existing spectrum users. The UAT technical requirements were developed, refined, and bench tested to assure that the presence of UAT signals has no detrimental effect on the operation of DME or radar transponder equipment, including co-sited equipment (*e.g.* installed on the same aircraft). Furthermore, the UAT signal in space format was designed to be highly tolerant to the presence of Link16 signals, including high RF power levels and high Time Slot Duty Factors.

While the UAT signal is compatible with DME/TACAN signaling, including a co-channel assignments, the maximum UAT system performance can best be achieved when no other high-power signals are present on-channel (978.0 MHz), or on either of

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[3] *FNPR,* Section IV. A., ¶77.

the adjacent channels (977.0 and 979.0 MHz). Achieving the maximum UAT system performance would preclude authorizing any other high-power emissions on these frequencies.

The UAT system is, however, compatible with and tolerant of low-level (generally less than 1 watt) transmissions on both 978.0 MHz and 979.0 MHz, such as are presently authorized by radionavigation land test (RLT) equipment. These low-level transmissions can co-exist with UAT operations and no incompatibility will result.

Section 2.106 Table of Frequency Allocations Issues

In 47 C.F.R. § 2.106, the entire spectrum band from 960 to 1215 MHz is defined as "Aeronautical Radionavigation," which is regulated in by Part 87. The Table of Frequency Allocations references two significant footnotes:

- 5.238 indicates that the band is reserved on a world-wide basis "for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities"; and
- US224, which permits the band to be used by government systems using spread spectrum techniques for communication, navigation, and identification purposes.

This second note, U.S.224 is in place to permit the Link16 secure digital communication system on a non-interfering basis. Other existing users of this spectrum band include DME transponders and interrogators, ATCRBS / Mode S radar transponders and interrogators.

A key issue here appears to be whether the use of 978 MHz for ADS-B signals, and FIS-B uplink signaling by ground stations, represents an "airborne electronic aid to air navigation" as referenced at note 5.238. Within the body of Part 87, it is clear that many types of signaling are approved that are not strictly navigation-oriented. For

example, radar transponders are used for surveillance, not navigation. Similarly, Emergency Locator Transmitters are a safety device, not for navigation. Further, Part 87 Subpart F discusses Aircraft Stations, and makes clear that Aircraft stations are intended to be used for purposes of "safe, efficient, and economic operation of aircraft and the protection of life and property" (*see* §87.185 (a)).

Accordingly, it is entirely appropriate that the details of the use of this spectrum band continue to be specified within Part 87, that Part 87 is consistent with the frequency allocation as specified at Section 2.106, and that no modifications to Section 2.106 (Table of Frequency Allocations) are necessary.

Comments on Proposed UAT Rules

On Page B-5 of the FNPRM, with reference to §87.139, it is believed there is a typographical error in paragraph (2). Where the existing language reads "at least 43 + 1-log (P)", the language should read should read "at least 43 + 10 log (P)."

On Page B-11, the Frequency Table in §87.173, Garmin AT believes that the proposed rules do not include the modifications that would reference the station codes and subparts on which UAT use is authorized. Garmin AT therefore recommends that in addition to subpart Q, subparts F, I, L, M, and O should also be listed.

For additional clarity, Garmin AT suggests that new station class codes be defined for the following types of UAT stations, with the applicable Subparts identified:

- Airborne UAT station (Subparts F and M)
- Ground UAT station (Subparts I, O, and Q)
- Surface Vehicle UAT station (Subpart L).

On Page B-12, Garmin AT thanks the FCC for correcting a typographical error in our original NPRM comments, where we inadvertently used the wrong section number to refer to the "Aeronautical Enroute and Fixed" service (§87.263 vs. §87.163).

On Page B-13, the text proposed for authorizing Control Tower stations to use UAT transmissions is more appropriate for describing the authorized frequencies, rather than the Scope of Service, as is shown elsewhere on FNPRM Pages B-12 and B-13. Garmin AT therefore suggests moving the proposed text from §87.417 (c) to a new paragraph §87.421 (e).

The FCC has not proposed any rules for UAT station identification or symbols in the FNPRM, leaving the subject open for further discussion. To properly identify all of the different services that may wish to use UAT technology, Garmin AT proposes that a UAT station class code be defined and used where appropriate.

The FNPRM proposes a 1 watt maximum limit for UAT test stations, and Garmin AT agrees that the limit is acceptable.

With reference to §87.471 (Radiodetermination Service - Scope of Service), the Commission did not include specifying UAT FIS-B data transmissions in the Scope of Service. However, the Frequency authorization (in §87.475) for 978.0 MHz for UAT service, and by land test stations, is included, and is therefore believed to be sufficient. Garmin AT's proposal was simply to lay the groundwork for using the airborne reception of UAT transmissions by ground stations as a backup navigation source. Because this appears to be included, no further action on this item appears necessary.

Conclusion

Garmin AT respectfully requests the Commission to expeditiously adopt rules for UAT services in accordance with the foregoing comments.

Respectfully submitted,

GARMIN AT, INC.

By: /s/ George Cooley
George Cooley
RF Design Engineering
Team Leader
Garmin AT, Inc.
2345 Turner Road S.E.
Salem, OR 97302
503-391-3258

July 12, 2004